

APPENDIX O

PROPOSED MITIGATION MEASURES

BP CHERRY POINT COGENERATION PROJECT

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EXECUTIVE SUMMARY

This appendix provides a consolidated summary of the proposed mitigation measures to be implemented by BP in connection with the BP Cherry Point Cogeneration Project (Cogeneration Project). The mitigation measures identified here are addressed in greater detail in Part II, Chapter 3 and in the technical appendices provided in Part III of this Application for Site Certification (ASC). As demonstrated elsewhere in the ASC, the Cogeneration Project has been designed to avoid and minimize adverse environmental impacts as much as possible. Where environmental impacts cannot be wholly avoided, mitigation measures have been proposed. In several instances, the mitigation measures will result in an overall improvement in biophysical conditions and land uses:

- The Cogeneration Project will be constructed entirely on BP property, located within the Cherry Point Major Industrial Urban Growth Area/ Port Industrial Zone and zoned for Heavy Impact Industrial development.
- The Cogeneration Project will be more fuel-efficient than the stand-alone power plants that would otherwise be expected to be meet growing electricity demands in the region. This higher efficiency means that electrical demand will be met with less natural gas consumed, and fewer criteria pollutant and greenhouse gas emissions generated.
- The Cogeneration Project will enable BP to make several modifications at the Cherry Point Refinery that will reduce air emissions. The result would be a net decrease of total criteria pollutant emissions while generating 720 MW of power for the region.
- The Cogeneration Project will minimize fresh water consumption by using dry cooling technology instead of a fresh water evaporative cooling system, and by taking advantage of water recycling and reuse opportunities at the Refinery. The Cogeneration Project will provide steam to the Refinery that would otherwise be generated in the Refinery's boilers. Blowdown from the Cogeneration Project, in turn, would be sent to the Refinery for reuse. The net result will be an increase of only 40 gpm (average) over the Refinery's existing water demand, and only a 2% increase in treated wastewater flow.
- The Cogeneration Project will preserve the Terrell Creek watershed resource by keeping stormwater runoff in the watershed. Stormwater runoff from project site roads and other impervious areas would be collected in an oil-water separator to draw off any trace oil and then routed to a detention pond to allow sediment to settle out. Once clarified, the water would flow to wetland mitigation areas north of Grandview road. Stormwater runoff from around the site would be routed to these mitigation areas as well.
- Although the Cogeneration Project will disturb approximately 33 acres of low-value wetlands, BP is developing a wetland mitigation plan that will result in a net increase in wetland functions and values and in an overall improvement in habitat value.

TABLE OF CONTENTSPage No.

1.	INTRODUCTION	1
2.	EARTH	2
3.	AIR QUALITY	4
3.1	Construction	4
3.2	Operation and Maintenance	4
4.	WATER RESOURCES	6
4.1	Construction	6
4.1.1	Stormwater Control and Treatment During Construction	6
4.1.2	Construction Wastewater Discharges	7
4.2	Operation and Maintenance	7
4.2.1	Stormwater Control and Treatment During Operation	8
4.2.2	Operation Wastewater and Process Water Discharges	9
4.2.3	Water Consumption During Operation	9
4.2.4	Groundwater	10
5.	WETLANDS AND VEGETATION	11
5.1	Construction	11
5.2	Operation and Maintenance	12
6.	AGRICULTURAL CROPS AND LIVESTOCK	13
7.	WILDLIFE	14
8.	FISHERIES RESOURCES	15
9.	ENERGY AND NATURAL RESOURCES	16
9.1	Construction	16
9.2	Operation and Maintenance	16
10.	NOISE	17
11.	LAND USE	18
12.	VISUAL, LIGHT AND GLARE	19
13.	POPULATION, HOUSING AND ECONOMICS	20
14.	PUBLIC SERVICES AND UTILITIES	21
15.	CULTURAL RESOURCES	22
16.	TRAFFIC AND TRANSPORTATION	23

17.	HEALTH AND SAFETY	24
17.1	Construction	24
17.1.1	Fire Prevention and Response Plan	24
17.1.2	Medical Emergency Plan	24
17.1.3	Spill Prevention Plan	24
17.1.4	Hazardous Construction Materials Management	25
17.1.5	Hazardous Waste Management	25
17.1.6	Explosion Risk Management Plan	25
17.2	Operation and Maintenance	26
17.2.1	Fire Prevention and Response Plan	26
17.2.2	Spill Prevention Plan	26
17.2.3	Hazardous Waste Management	27
17.2.4	Prevention of Natural Gas Release During Operation	27
17.2.5	Explosion Risk Management Plan	27

1. INTRODUCTION

This appendix summarizes the various mitigation measures BP proposes to implement during the construction and operation of the BP Cherry Point Cogeneration Project (Cogeneration Project) to minimize potentially adverse impacts on the physical and/or human environments. The mitigation measures identified here are addressed in greater detail in Part II, Chapter 3 and the Part III technical appendices of this Application for Site Certification (ASC). In particular, the evaluation of potential impacts and rationale for these mitigation measures are provided in Part II, Chapter 3 and are not repeated here.

This appendix has been organized to correspond to the section headings for each discipline described in Chapter 3. Proposed mitigation measures to be implemented during each of the construction and operation phases of the Cogeneration Project are summarized for each discipline in the following sections.

2. EARTH

The Cogeneration Project site is well suited for the construction of a large industrial facility. There would be no significant impacts related to the geology of the site.

Stormwater and Erosion Control

During construction of the Cogeneration Project, Best Management Practices (BMPs) will be implemented for erosion control and prevention. The BMPs will be described in a Stormwater Pollution Prevention Plan (SWPPP) and Temporary Erosion and Sedimentation Control Plan (TESC) to be submitted to EFSEC prior to construction. BMPs may include, but will not necessarily be limited to, the installation of control structures such as silt fences/straw bales, sediment traps, and diversion ditches.

Construction activities will also be controlled to limit erosion. Graded areas will be smoothed and compacted such that they are free from irregular surface changes, and sloped to drain. Extensive grading of the site will not be required because the existing slopes are 1% or less. Disturbed areas will be bermed with stabilized soil berms or sand bags to prevent erosion from impacting adjacent areas. Stockpiled soils from excavations and/or imported fill will be stabilized and protected using BMPs in accordance with the detailed SWPPP and TESC. Maintaining surficial moisture content with regular application of water will control dust control and wind erosion.

Excavated materials of acceptable quality will be reused as much as possible. Excavated materials that will not be reused will be disposed of at permitted sites. Excavated materials will not be placed on slopes steeper than 3 horizontal: 1 vertical unless compacted to the requirements of structural fills. Upon completion of construction, disturbed areas will be revegetated by seeding or hydroseeding. Seed mixes would be selected that are known to effectively stabilize erodible soils in the northwestern portion of the State of Washington. Sprinkler systems may be employed to sustain vegetation on bermed areas with high exposure to the erosive forces of wind.

Soil stockpiles will be covered with tarps or emulsion and surrounded by silt fences and/or straw bales or sand bags, where necessary, to prevent excessive erosion by wind or rain.

Erosion control measures for construction, such as silt fencing, straw bales, tarps, etc., will be inspected and maintained periodically and after major storm events as needed to ensure their continued effectiveness.

Stormwater runoff from the construction site will be collected and routed to an oil-water separator system to trap any trace free oil and then to detention ponds to allow sediment to settle. Detention ponds would be sized for likely events ranging from typical storms (6-month, 24-hour) up to a 100-year, 24-hour event.

Seismic Hazards

The Cogeneration Project will be designed and built in accordance with applicable federal, state and local building standards and seismic codes specifically for power generating facilities. In particular, the Cogeneration Project will be designed to comply with Seismic Zone 3 requirements.

Site-specific geotechnical studies will be conducted as part of the detailed engineering design process. If soft soils with low average shear wave velocity are confirmed beneath the site during these geotechnical studies, then site-specific dynamic response analysis will be completed. This analysis will assess the potential amplification of earthquake ground motions through these soft soils. The dynamic response analysis will be used during project design to incorporate appropriate engineering measures address potential seismic impacts.

3. AIR QUALITY

3.1 Construction

Dust may be generated during construction of the Cogeneration Project, primarily during site grading and fill. However, much of the site will use gravel, aggregate, or other clean granular materials to provide solid working and traveling surfaces, including access roads.

BP will use water to reduce dust on roads and active construction areas where soil is exposed. In addition, and where applicable, exposed areas will be promptly revegetated to further restrict potential dust sources. Exposed topsoil storage piles will be covered with polyethylene sheeting, or other approved materials, to reduce fugitive dust.

3.2 Operation and Maintenance

The design and operation of the Cogeneration Project allows BP to incorporate significant mitigation for potential air impacts. Key mitigation measures are described below.

Greater Efficiency and Less Emissions

The Cogeneration Project will enable the Cherry Point Refinery to decommission older, less efficient boilers used for Refinery steam supply and make other emission reductions. A net decrease of total criteria pollutant emissions would result while generating 720 MW of power for the region.

The Cogeneration Project will be more fuel-efficient than comparable merchant power plants. Less natural gas is used per kWh of electricity, and less CO₂ is produced as a result.

Best Available Control Technology

BP will mitigate the air emissions from the facility by burning only natural gas. NO_x emissions from the CGTs and duct burners will be controlled to the BACT level of 2.5 ppmvd average at 15% O₂ through the use of selective catalytic reduction (SCR). Although clearly more expensive than BACT requires, a catalytic oxidation system will be installed for the control of CO emissions to an annual level of 2.0 ppmvd at 15% O₂. This catalytic oxidation system will also provide the added benefit of controlling about 30 percent of the VOC emissions, including toxics. Other pollutants will be controlled using good combustion technology and good operating practices and the combustion of low-sulfur natural gas as a fuel.

Greenhouse Gases

In 1997, BP became concerned about the influence of man-made greenhouse gas (GHG) emissions on changes in the world's climate. Rather than wait for proof that such a linkage existed, BP took action by targeting a 10% reduction in the company's worldwide GHG emissions from 1990 levels to be achieved by the year 2010. In early 2002, BP met this target, receiving independent verification of a reduction in annual GHG emissions of 9.5 million metric tonnes. Having met this target, BP set a new objective to hold net GHG emissions at the same level through the year 2012, while absorbing all new growth in company operations.

Because it is possible for the Cogeneration Project to change ownership, the GHG mitigation proposal must be able to accommodate such changes. As long as the Cogeneration Project is owned by BP, the Project's GHG emissions would be a part of BP's new GHG objective and the Project's emissions would be offset by GHG emission reductions within BP's worldwide operations. If, at some point in the future, BP did not own the Cogeneration Project, mitigation for Cogeneration Project GHG emissions would be provided as described below:

1. The proposed CO₂ emission standard will be 0.675 lbs CO₂/kWh calculated on the basis of Cogeneration Project Fuel Charged to Power in Btu/kWh.
 - a. Fuel Charged to Power equals (Total Fuel Consumed by the Cogeneration Unit less Fuel Charged to Steam) divided by net kWh generated.
 - b. Fuel Charged to Steam is equal to the steam energy used by the Refinery divided by a conversion factor of 0.909 (LHV/HHV).
2. Emissions in excess of the emission standard would be mitigated either by (a) an annual payment to a qualifying organization such as the Climate Trust of \$0.57/ton CO₂, or (b) GHG reductions obtained by the Cogeneration Project owner, or (c) a combination of the two.
3. Mitigation would be satisfied annually for 30 years, which is the assumed economic life of the project. Mitigation would be reported to EFSEC annually.

4. WATER RESOURCES

The Cogeneration Project is located in the Terrell Creek watershed, which is included in Water Resources Inventory Area 1 (WRIA) as designated by the Washington State Department of Ecology. The Cogeneration Project has been designed to maintain, as much as possible, the existing hydrologic regime and water quality of the Terrell Creek watershed.

The Cogeneration Project will not require any new water intakes or associated facilities to withdraw water from the Nooksack River, Terrell Creek, or other surface watercourses. Similarly, construction and operation of the Cogeneration Project will not impact groundwater supplies, flows, or quality.

In addition, the Cogeneration Project has been designed to minimize fresh water use by including the use of air-cooled condensers and recycling of HRSG blowdown water from the Cogeneration Project for use at the Refinery.

4.1 Construction

4.1.1 Stormwater Control and Treatment During Construction

Due largely to site topographic characteristics plus minimal grading required for the Cogeneration Project, no modifications to the surface or groundwater regimes, other than routing stormwater around the site will be necessary. Runoff quantities for the site during construction would remain approximately the same as the present condition. Stormwater quality will be preserved during construction by preventing, to the degree possible, erosion on site, and utilizing settling and detention basins prior to discharging the stormwater into the natural drainage system north of Grandview Road. Stormwater will be discharged into the Terrell Creek hydrologic basin as it does today.

The project site design will preserve the Terrell Creek watershed resource and promote hydrology of the wetland mitigation areas. Stormwater runoff from project site roads and other impervious areas would be collected in an oil-water separator to draw off any trace oil and then route the stormwater to a detention pond to allow sediment to settle out. Once clarified, the water would be allowed to flow to wetland mitigation areas north of Grandview Road. Stormwater runoff from around the site would be routed to these mitigation areas as well.

A SWPPP for construction will be prepared for the plant site, and will include stormwater management procedures. The SWPPP will include a TESC Plan for the Project site. The SWPPP and TESC Plan will specify Best Management Practices (BMPs) for construction activities based upon Ecology's Stormwater Management Manual for Western Washington. The grading plan for the site will also specify the BMPs to control erosion. All erosion control BMPs will be in place and functioning prior to the start of construction.

The Stormwater design for the NPDES Permit application for construction activities is provided in Appendix F: Technical Report on Water (Attachment A, "*Surface Water Management System Design Basis*"). Diversion ditches will prevent surface water runoff from areas outside the Cogeneration Project site from entering the site. Stormwater runoff from within the Cogeneration Project site will be contained, collected, and routed to the stormwater treatment and detention system. Silt fences and temporary swales would lead the majority of the runoff to the treatment and detention system. Perimeter silt fences around the construction zone will be installed to remove sediment from surface runoff before it reaches the site boundaries. Additional localized silt fencing will be used as required during construction to minimize erosion and transport of soil.

Temporary swales would be constructed to accommodate areas being excavated or filled. Once the preliminary cut-and-fill work is complete, the swales will likely remain in place until final grading. Wherever possible, temporary swales will be incorporated into the permanent stormwater collection system. The perimeter silt fence will not be removed until the site has been stabilized. In general, the stormwater treatment and detention system will consist of oil-water separation system equipped with a shutoff valve in case of an accidental release for containment. Emergency cleanup equipment and supplies will be available on-site for rapid response. Stormwater will be discharged from the oil-water separation system into a final treatment and detention pond properly sized in accordance with Whatcom County and Ecology requirements, and then eventually discharged to wetlands from the detention pond. The receiving wetlands will be in the same hydrologic basin from which the stormwater originated.

Runoff quantities from the water supply and natural gas connections during construction will be approximately the same as the natural (existing) conditions. Runoff quality from these areas will be controlled through the use of erosion control BMPs such as silt fences, hay bales, diversion ditches, and plastic covering to protect soils from erosion and ensure runoff from these areas is within water quality limits.

4.1.2 Construction Wastewater Discharges

During construction, hydrostatic test water will be discharged to the Refinery wastewater treatment system. The quality of the water will be tested and will be within acceptable limits for discharge to the treatment system. After treatment, the hydrostatic test water will be discharged to the Strait of Georgia through Refinery Outfall 001 under the Refinery's NPDES permit. As explained in Part II, section 3.3, discharges will not adversely affect the environment. Additional mitigation is, therefore, not required.

4.2 Operation and Maintenance

The Cogeneration Project will not discharge wastewater directly into any watercourses (including creeks, lakes, wetlands, ditches, or the marine environment), or storm drains, nor will it require any new outfalls. During operation of the Cogeneration Project, wastewater will be generated from:

- Stormwater;

- Process water associated with blowdown from the steam circuit and from the water purification process; and
- Sanitary wastewater.

Mitigation measures to be implemented with respect to each of these waste streams are summarized below.

4.2.1 Stormwater Control and Treatment During Operation

During operation, the Cogeneration Project will utilize most of the same stormwater system designed for project construction. Grassy swales around the perimeter of the site will provide initial treatment of stormwater prior to its release into a detention basin and then into a wetland mitigation area on the north side of Grandview Road. While acting to filter and cleanse the stormwater, the grassy swales would also provide a source of food and nutrients in the form of leaf litter and insect drift for downstream fisheries resources in the Terrell Creek watershed. Stormwater quality from the site is anticipated to be equal to, or better quality than, that which is currently being discharged from the site.

A SWPPP will be developed for facility operations, which will include structural and operational BMPs, a Spill Prevention Control and Countermeasure (SPCC) Plan, a final stormwater management plan, and general operating procedures. The SWPPP will be completed and implemented on site when plant operation commences. The SPCC Plan for operation would identify structural, operational and treatment BMPs. BMPs will include impervious containment, covers, spill control and cleanup equipment, good housekeeping, employee training, spill prevention procedures, preventative maintenance and inspections, oil-water separation systems, and detention ponds.

The Stormwater design for operation of the Cogeneration Project is provided in Appendix F: Technical Report on Water (Attachment A, “*Surface Water Management System Design Basis*”). Generally, the Project site will be divided into three primary drainage areas for the purposes of stormwater runoff control and treatment.

First, the switchyard area on the eastern portion of the site will be surfaced with crushed rock to allow some percolation into the underlying soils. The area will be graded at about a 1 percent slope to allow sheet flow to discharge towards a collection system consisting of swales, catch basins, manholes and underground pipe.

Second, the power block, air-cooled condensers and most of the remaining plant areas will be asphalt-paved or covered with buildings. The surfaces in this area will be sloped from a high point located near the center of the main pipe rack towards low points located along the edge of the plant roads. Runoff will be sheet flow across the site towards a collection system similar to that described above. All surface runoff will be captured by the surface drainage system then be directed through an underground piping system to an oil-water separator and stormwater detention pond. Stormwater

will be discharged to wetlands from the detention pond. The receiving wetlands will be in the same hydrologic basin (Terrell Creek) from which the stormwater originated.

Third, stormwater accumulating within the secondary containment structures from outside tanks or curbed areas would be collected and routed to the Refinery's wastewater treatment system. This stormwater is expected to be a small volume and will be separated from other stormwater surface runoff.

4.2.2 Operation Wastewater and Process Water Discharges

Mitigation of the industrial wastewater discharge from the Cogeneration Project would involve treatment in the Refinery's wastewater treatment system prior to discharge to the Strait of Georgia. Wastewater discharges into the BP wastewater treatment system from the Cogeneration Project would be approximately 50 gpm on average.

The wastewaters from the Cogeneration Project will originate as three streams:

- Demineralization treatment plant regeneration and filter backwash water,
- Turbine air compressor wash water, and
- Collection of water and/or other minor drainage from various types of equipment.

Boiler blowdown will be recycled for use in the Refinery. The remaining process wastewater produced by the Cogeneration Project would be sent to the Refinery's wastewater treatment system. This water would increase the treated wastewater flow by 2% on average, well within the fluctuations of the Refinery wastewater flow rate. Properties of the combined treated wastewater stream regulated by the existing NPDES permit would change 1% or less; in fact some properties are improved. No changes in the NPDES permit's effluent limitations will be necessary, although the Refinery will have to modify its permit to recognize the additional waste stream. After treatment in the Refinery wastewater treatment system, wastewater from the Cogeneration Project would be discharged along with the Refinery wastewater to the Strait of Georgia.

Wastewater from equipment sumps, maintenance cleaning, and demineralization of raw feed water would also be routed to the Refinery wastewater treatment system and discharged through the NPDES-permitted outfall (number 001).

4.2.3 Water Consumption During Operation

The Cogeneration Project would minimize fresh water consumption by using an Air Cooled Condenser (ACC) instead of a fresh water evaporative cooling system, and recycling and reusing water with the Refinery. Operation of the Cogeneration Project will only result in a 40 gpm (average) increase in fresh water consumption over that currently used by the Refinery. The Whatcom County PUD would supply the additional industrial water under an existing agreement with BP and has available certified diversion rights for this water.

4.2.4 Groundwater

Groundwater recharge to the Deming Sand Aquifer will not be affected by the Cogeneration Project. The Deming Sand aquifer is recharged from distant hills and from leakage through the overlying Bellingham Drift aquitard. The leakage through the Bellingham Drift occurs over the entire aquifer aerial extent. Stormwater collected on the Cogeneration Project site will be routed to an unlined surface detention pond and allowed to infiltrate or discharge to wetlands within the same hydrologic basin. The net effect would be returning the collected stormwater to the same hydrologic system for recharge.

Although stormwater that accumulates within storage tank containment structures will be treated through the Refinery system and discharged to the Strait of Georgia, this stormwater represents less than 5 percent of the entire stormwater to the proposed Cogeneration Project (~33 acres). This diverted stormwater represents approximately only 0.02 percent of total stormwater to the sub-basin, which is about 10,000 acres (17 square miles). Because no impacts to groundwater quality or quantity are anticipated, no further mitigation measures are warranted.

5. WETLANDS AND VEGETATION

The Cogeneration Project will disturb approximately 33 acres of low-value wetlands that have formed since farming stopped on the Project site in the 1960s. The Cogeneration Project will mitigate this loss of wetlands by creating and enhancing wetlands directly north of the Project site as described below. The mitigation plan will be designed to produce a net increase in wetland functions and habitat value.

BP is proposing a combination of wetland creation and enhancement on BP-owned lands north of Grandview Road. These lands currently consist of both upland habitats and low-value wetlands. The wetland mitigation plan will be designed to improve the quality, productivity, and diversity of wetlands within the vicinity of the Cogeneration Project.

The wetland mitigation measures would be initiated prior to construction of the Cogeneration Project, and maintained in perpetuity throughout the operation and maintenance phases of the Project. They will be designed, monitored, maintained, and managed to create a more diverse, higher quality wetland system that will benefit the regional wetland environment.

5.1 Construction

- Creation of new wetlands on the north side of Grandview Road. These wetlands would be hydraulically connected to Terrell Creek and provide a source of food and nutrients to downstream fisheries resources. They would also serve as a wildlife and waterfowl sanctuary for various species of mammals, birds, reptiles, and amphibians.
- Enhancement of existing wetlands to increase the total area and productivity of higher functional value wetlands. Enhancement may include the planting of coniferous trees to enhance the visual screening of the plant from Grandview Road.
- Native vegetation, where possible, would be preserved to reduce erosion and limit disturbance to existing habitat.
- The following activities and BMPs would occur to protect the native vegetation within the Cogeneration Project area:

- Native seed mixes, including native grasses, would be applied to areas that are not proposed to be disturbed. This will aid in the control of sediment runoff and erosion;
- Native vegetation would be used to replace vegetation that is temporarily disturbed due to construction activities;
- Silt fencing and weed-free straw bales would be used to control runoff, where appropriate;
- BP would prepare and implement a landscaping plan that includes long--term weed control measures;
- Before and after grading operations which disturb existing grasses, equipment shovels or blades would be inspected and cleaned as required to minimize the release and proliferation of noxious weed species.

5.2 Operation and Maintenance

The wetlands to be created and enhanced during construction of the Cogeneration Project would be monitored by BP for a 10-year period following their development to evaluate and manage their success, and maintained as a wildlife and waterfowl sanctuary.

No additional loss or impacts to the existing or the created wetlands will occur during the operation and maintenance phases of the Cogeneration Project, therefore, no additional mitigation measures beyond those proposed for the construction of the project, are required.

6. AGRICULTURAL CROPS AND LIVESTOCK

The Cogeneration Project will not significantly affect any agricultural lands.

Construction of the Project will result in the loss of a relatively small area (about 1.5 acres) currently used to grow hybrid poplar trees. Due to the low price of pulpwood, BP does not have any specific plans to harvest these trees or to continue poplar farming in the future. Accordingly, no mitigation is proposed.

Minor impacts may also result from loss of approximately 30 acres of BP-owned grazing land for the creation and enhancement of wetlands north of Grandview Road.

However, this area is zoned for industrial development and is located on land zoned for is located within the Cherry Point Major Industrial Urban Growth Area/ Port Industrial Zone. No mitigation is necessary or appropriate.

7. WILDLIFE

Based on the assessment of wildlife resources and habitats conducted as part of this ASC, wildlife use within the area of the Cogeneration Project is low, as evidenced by the lack of wildlife trees, snags, raptor nests, or heron rookeries. No impact to threatened or listed species is expected from the project. No significant impact to wildlife in the Cogeneration Project area is expected because the Project will expand an existing industrial facility rather than the convert a rural or pastoral site to industrial use. Light, sound and activity around the Cogeneration Project will be similar to those of the Refinery, to which wildlife have adapted over the past 30 years.

To mitigate potential minor impacts to wildlife, BP proposes to:

- Plant native trees and shrubs parallel to the south side of Grandview Road, north of the Cogeneration Project site and north of the laydown areas, to the west of Blaine Road. These trees and shrubs will provide habitat for various birds, mammals, and reptiles.
- Create and enhance wetlands north of Grandview Road to mitigate impacts to wetlands. The wetland mitigation plan will be designed to result in a net increase in wetland functions and habitat values. The mitigation area will be monitored, managed, and maintained by BP to ensure that the quality, diversity, productivity, and area of wildlife habitat is not compromised.

8. FISHERIES RESOURCES

Although there are no watercourses on the site of the proposed Cogeneration Project, the site is located within the Terrell Creek watershed.

Construction and operation of the Cogeneration Project will not involve any instream works, or result in the harmful alteration, disruption, or destruction of fish habitat. In fact, with the implementation of the proposed wetland mitigation measures, which will involve both the creation and enhancement of wetlands, there will be an overall net increase in food/nutrient availability for downstream fisheries resources.

The primary objectives for the protection of downstream fisheries resources during construction and operation of the Cogeneration Project will be to maintain water quality and to sustain existing baseline flows. These objectives will be achieved by implementing the following mitigation measures:

- Development of stormwater system to keep runoff within the watershed. Oil-water separators and settling ponds will maintain water quality.
- Development and implementation of SWPPPs for both construction activities and facility operation. The SWPPPs will incorporate BMPs to reduce erosion and protect downstream fish resources.

9. ENERGY AND NATURAL RESOURCES

Anticipated energy and natural resource used during the construction and operation of the Cogeneration Project plant include electricity, natural gas, water, and certain non-renewable resources such as sand and gravel. An existing natural gas supply line, water supply lines, wastewater treatment plant, and sanitary waste line will be used for the Project, and a previously permitted transmission line corridor would carry power to BPA's transmission line running along the eastern edge of BP's property.

9.1 Construction

Small quantities of electricity, water, natural gas, and non-renewable resources will be consumed during construction of the Cogeneration Project. No adverse impacts to energy and natural resources are anticipated. BP and the EPC contractor will make efforts to reduce, recycle, and/or reuse resources, where possible, consistent with the implementation and use of industry standard BMPs. These BMPs may include the use of energy-efficient lighting, lighting of only critical areas during non-working hours, encouraging car-pooling, efficient scheduling of construction crews, minimizing idling of construction equipment, recycling of used motor oils and hydraulic fluids, and implementation of signage to remind construction workers to conserve energy and water.

9.2 Operation and Maintenance

The following mitigation measures have been identified to reduce the potential impacts on energy and natural resources during operation and maintenance of the Cogeneration Project:

- Design and implementation of air-cooling system and recycling of water as a mitigation measure to minimize fresh water consumption.
- Cogeneration will make more efficient use of the energy in natural gas by producing steam for the Refinery as well as electricity.
- Existing boilers would be taken out of service and replaced with more efficient Cogeneration Project steam generation cycle, reducing the use of natural gas resources.

10. NOISE

During Project construction, BP will mitigate noise by requiring its EPC Contractor to:

- Comply with all federal and local regulations on truck and construction equipment noise, and use appropriate mufflers on all engine-driven equipment;
- Limit loud construction activities to daytime hours (7 a.m. to 10 p.m.); and

Operational noise has been mitigated in the design and configuration of the Cogeneration Project. In particular:

- The Cogeneration Project is sited 337 feet from the nearest public road (Grandview Road), to minimize detectable noise levels at the road and elsewhere.
- The three gas turbine generators have been located on the southern portion of the Project site, furthest away from noise receptors to the north and northeast. This configuration takes advantage of optimal sound reduction through physical barriers created by the plant itself.
- The steam turbine generator will be placed within a building.

Based on the proposed plant configuration, noise modeling indicates that the Cogeneration Project will not result in any significant noise impacts.

11. LAND USE

The entire project, including the Cogeneration Project and support facilities, the new transmission line, natural gas and water supply lines, and construction laydown areas would be on BP-owned property, immediately adjacent to the existing Refinery, which has operated at this site since 1971. The Refinery and proposed Cogeneration Project are contained within the Cherry Point Major Industrial Urban Growth Area/ Port Industrial Zone, as defined in the Whatcom County Comprehensive Plan (1997), on land that is zoned Heavy Impact Industrial.

With the implementation of other mitigation measures discussed in this ASC, construction and operation of the Cogeneration Project will not result in any significant unavoidable adverse impacts to land use. Therefore, additional mitigation measures related to land use activities throughout the construction and operation phases of the project are not necessary.

12. VISUAL, LIGHT AND GLARE

There will be no significant adverse visual, light, and glare impacts during the construction and operation of the Cogeneration Project.

Prior to construction, BP will require its EPC Contractor to prepare a Site Management Plan to provide for the orderly storage and assembly of equipment, supplies, construction materials, soils, aggregates, temporary buildings, and structures. The intent of the Site Management Plan will be to ensure that the EPC Contractor commits to minimizing overall visual impacts associated with the construction of the Cogeneration Project.

To mitigate visual, light and glare impacts of the operating facility, mitigation measures will include:

- The facility will be painted with earth-tone colors.
- The HRSG stacks will be painted a light, warm-tone gray or similar color.
- Plant trees between the Cogeneration Project site and Grandview Road.
- Provide additional screening, as appropriate, by including tree/shrub plantings, and plant vines at recommended intervals around the perimeter of the galvanized chain link fence.
- Project site lighting will be designed to minimize light spillover and glare.

13. POPULATION, HOUSING AND ECONOMICS

The Cogeneration Project will provide significant employment opportunities in Whatcom County and result in substantial increases in local and State tax revenue. There will be no adverse impacts on population, housing and economies within the study area or within State of Washington associated with the construction and operation of the Cogeneration Project. Therefore, no mitigation measures are proposed.

14. PUBLIC SERVICES AND UTILITIES

There will be no adverse impacts on public services and utilities associated with the construction and operation of the Cogeneration Project. BP will be supported by the Refinery's fire, security and emergency medical staff sufficient to cover all but the most extreme, and improbable, emergencies. Moreover, the Cogeneration Project will result in a substantial net fiscal benefit to Whatcom County, paying significant amounts in taxes while not placing incremental demands on local government spending. Accordingly, no mitigation measures are proposed.

15. CULTURAL RESOURCES

BP has contracted with the Lummi Tribe to conduct an archaeological investigation on areas that would potentially be affected by construction of the Cogeneration Project. These areas include the Cogeneration Plant site, laydown areas, access roads, power transmission line tower locations, and wetland mitigation areas north of Grandview Road. Based on the archaeological investigation conducted to date, no significant cultural resources have been identified. Additional shovel probe investigations will be undertaken within the vicinity of the Cogeneration Project site, laydown areas, as well as areas proposed for wetland mitigation once the final location and configuration of these areas are known. If significant cultural resources are located during those investigations, recommendations will be provided for appropriate mitigative actions.

BP will retain a qualified archaeologist during excavation activities to watch for artifacts or cultural resources on the Project site. Should such resources or artifacts be discovered, the Lummi Tribe would be promptly consulted. In accordance with the National Historic Preservation Act of 1966, construction activities would be halted until the archaeological features could be secured and removed from potential impact.

No mitigation measures are required during routine operation and maintenance of the Cogeneration Project, as there will be no potential for impacts to cultural resources.

16. TRAFFIC AND TRANSPORTATION

During construction, the following mitigation measures will be implemented:

- A traffic control plan will be developed and implemented.
- A responsible person will be designated as the Transportation Coordinator to manage site-generated traffic and parking.
- Shift hours will be staggered or adjusted as appropriate to minimize traffic impacts where feasible; carpooling would be encouraged.
- Permits or approvals will be obtained as required to conduct oversize or overweight hauls. BP will use its rail or barge facilities for delivery of heavy or oversized equipment as practical.

The traffic and transportation study recognized that there may be potential impacts to traffic during construction of the Cogeneration Project. BP intends to meet with the Washington Department of Transportation to discuss appropriate mitigation measures. These measures may include:

- Relocating the proposed site access road connecting with SR548 so that it complies with WSDOT guidelines for minimum sight distances. The road would be relocated so that it is between 660 feet and 750 feet east of Blaine Road.
- Adding a westbound left turn lane on Grandview Road at the Blaine Road intersection.
- Adding a traffic signal at the SR548 – Portal Way intersection.

Routine operation and maintenance of the Cogeneration Project is not expected to adversely affect traffic. Therefore, no additional traffic mitigation measures are proposed.

17. HEALTH AND SAFETY

Potential impacts related to risk of fire and explosion, spills, and hazardous or toxic materials management and handling will be effectively managed through BP's existing fire, medical emergency, and security infrastructure currently in place at the Refinery. During construction of the Cogeneration Project, BP's existing health and safety resources will be augmented by the EPC Contractor's first aid, fire response, and security personnel.

17.1 Construction

Prior to construction, BP will require its EPC Contractor to prepare and submit a health and safety program to address the management, prevention, and control of possible fire or explosion during construction of the Cogeneration Project. During mobilization at the initiation of the construction project, the EPC Contractor will coordinate with the Refinery Fire Marshal and the Whatcom County Fire Department regarding activities that will be occurring at the construction site.

17.1.1 Fire Prevention and Response Plan

During construction, fire prevention and detection will be the responsibility of the various contractors and individuals working at the site.

Safe working practices will be exercised. These will include, but will not be limited to:

- Maintaining appropriate fire extinguishers within easy access of any work being done;
- Prohibiting smoking; and,
- Using a permit system for all hot work (welding, cutting, and grinding) outside of designated "free burn" areas.

17.1.2 Medical Emergency Plan

Construction staff will address minor injuries and provide initial first aid on more serious situations. On-site treatment will be provided in medical situations that require first aid treatment only or stabilization until professional medical attention is obtained. Any injury or illness that requires treatment beyond first aid will be deferred to a local medical facility.

17.1.3 Spill Prevention Plan

The EPC Contractor will be responsible for implementing spill control measures and training of all construction personnel and subcontractors in spill avoidance. Training will also address appropriate spill response, containment, clean up, and reporting procedures consistent with applicable regulations and BP policy.

With respect to petroleum products located on site during and after construction:

- Lubrication oil stored on site will be contained in barrels. The barrels will be stored in a secondary containment area to contain any spillage, or in temporary warehouses;
- Construction refueling will be closely supervised to avoid leaks or releases. If fuel tanks are used during construction, the fuel tank(s) will be located within a secondary containment with an oil proof liner sized to contain the single largest tank volume plus an adequate freeboard allowance for rainwater.
- When filling transformers with oil, the oil will be pumped from a truck within a temporary secondary containment area to contain any spillage.

17.1.4 Hazardous Construction Materials Management

A specific area on the site will be designated for servicing and fueling the construction equipment. This will ensure localization of spills and implementation of appropriate control measures. The EPC Contractor's responsibility will include training of all construction personnel and subcontractors in spill avoidance, containment, cleanup, and reporting procedures consistent with BP policy and regulatory requirements.

Paint, coatings, solvents, adhesive materials, and other hazardous materials will be stored in a locked utility shed or secured in a fenced area. Storage will conform to OSHA and other applicable state guidelines. Construction personnel will be trained in handling hazardous materials and will be alerted to the dangers associated with these materials. An on-site Safety Engineer will be designated to implement health and safety guidelines and to contact emergency response personnel and the local hospital, if necessary. Material Safety Data Sheets for each on site chemical will be kept on site and construction employees will be made aware of their location and content.

17.1.5 Hazardous Waste Management

A licensed Solid Waste Management Contractor will be responsible for treating or disposing of wastes generated during construction in compliance with all federal, state, and local regulations. To minimize the potential release of hazardous materials during construction, BMPs will be employed, including good housekeeping measures, inspections, containment facilities, and spill prevention practices. EPC construction personnel will be instructed regarding the management requirements, and BP's on site Project Manager will be responsible for their implementation.

17.1.6 Explosion Risk Management Plan

The risks of fire or explosion during construction of the pipeline connections are minimal. Proper work and pipeline isolation procedures will safeguard this work. Examples of such procedures include locating and marking the existing gas pipeline to avoid construction damage, and limiting construction equipment or heavy haul

crossings to suitable designated locations. On-site inspectors from BP will be present during construction to verify that the EPC Contractor is following all engineering specifications and meeting all regulatory requirements.

17.2 Operation and Maintenance

During operation and maintenance of the Cogeneration Project, the Refinery's existing plans, procedures, and protocols for managing worker and public health and safety will be supplemented to include the Cogeneration Project. These include the existing:

- Safety and Health Manual;
- Emergency Preparedness Response Plan; and
- Fire Emergency Response Operations (FERO) Plan.

17.2.1 Fire Prevention and Response Plan

Prevention is the first consideration in any fire protection program. The following elements of fire prevention will be implemented during plant operations:

- Protective materials used for equipment and pipelines;
- Ability to gauge the contents of materials contained in storage vessels;
- Spill kits;
- Signs;
- Preventive maintenance program;
- Visual inspections;
- Good housekeeping;
- Procedures for handling flammable liquids;
- Mandatory HAZCOM written procedures and training program;
- Designated flammable storage areas;
- Employee training; and
- Regular safety and environmental audits.

17.2.2 Spill Prevention Plan

To minimize the potential for hazardous material and chemical spills during operation of the Cogeneration Project, the following measures will be implemented:

- Above ground containers for steam-cycle chemicals including oxygen scavenger, neutralizing amine, and phosphate storage tanks, will be located indoors and

will be contained in a curbed area sized sufficiently to contain the single largest storage tank volume;

- The above ground acid tank will be located within a secondary containment area lined with an acid-proof coating and sized with sufficient freeboard to accommodate rainwater;
- The above ground caustic tank will be located within a secondary containment area and sized with sufficient freeboard to accommodate rainwater;
- The above ground step-up transformer mineral oil storage tanks will be located within secondary containment areas that will hold the transformer volume plus an adequate freeboard to accommodate rainwater; and,
- An oily water sewer (OWS) system will collect selected equipment drains and potentially oily rainfall and washdown runoff from within the curbed areas. Collected drainage and runoff will be pumped to the existing Refinery treatment system.

17.2.3 Hazardous Waste Management

Very little waste will be produced during the operation and maintenance of the Cogeneration Project. The used lubrication and transformer oils, small quantities of used paints, thinners, and solvents used during operation will be disposed of in accordance with federal, state, and local regulations. Safeguards will include bermed secondary containment, tank overfill protection, routine maintenance, safe handling practices, supervision of all loading/unloading by plant personnel and the truck driver, and appropriate training of operation and maintenance staff.

17.2.4 Prevention of Natural Gas Release During Operation

BP will comply with all federal and state regulatory requirements regarding pipeline safety. In addition, all underground gas piping and pipeline connections to the Cogeneration Project will be protected by cathodic protection systems and corrosion-resistant coatings.

17.2.5 Explosion Risk Management Plan

Several mitigation measures will ensure prompt detection of a natural gas release at the Project site. First, the natural gas will be odorized with Mercaptan to it to give it a strong, distinctive odor that will make any gas leak readily apparent. Second, a breach in the natural gas system would result in a drop in the pressure of the gas line, which would be promptly detected in the control room, so that the system would be shut down until the situation is resolved. Automatic shutoff valves in the existing pipeline would close to limit the amount of gas that could leak from the system.

If a local, small gas leak were suspected, a combustible gas indicator (CGI) would be used to measure the percentage of oxygen and concentrations of natural gas in the ambient air.

In the event of a leak, the system will be isolated by closing the shutoff valve(s). The leaking section will be repaired or replaced by a licensed contractor. Upon completion of the repair work, the system will be pressure tested to ensure that the leak has been appropriately addressed.

Chances of a gas line failure are minimized by reducing the opportunities for failure. Pipeline appurtenances are limited areas within the fenced in areas of the plant site. The pipeline is buried in all other uncontrolled locations. Gas line appurtenances will be protected on the Cogeneration Site by being contained within buildings or within immediate fenced in areas. Bollards will be erected as required to ensure that on site vehicles are not able to reach critical areas. Access to critical areas will be limited to authorized personnel.